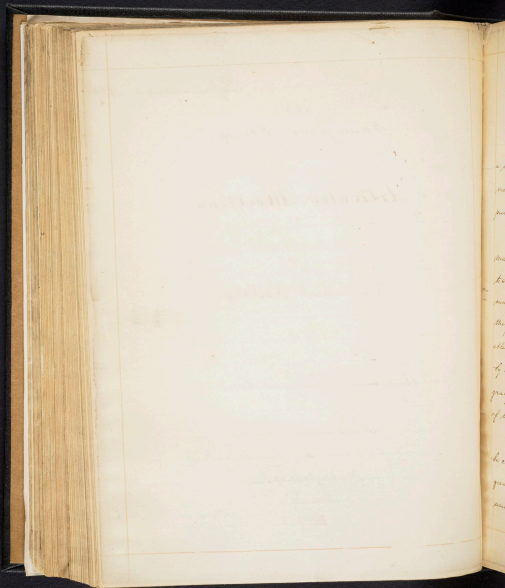


#7
Deposited March 3^d 1829

An
Inaugural Essay,
on
Articular Affections,

Submitted to
The Medical Faculty
of the
University of Pennsylvania
by
Richard Maris
of
Pennsylvania.
March
1829.

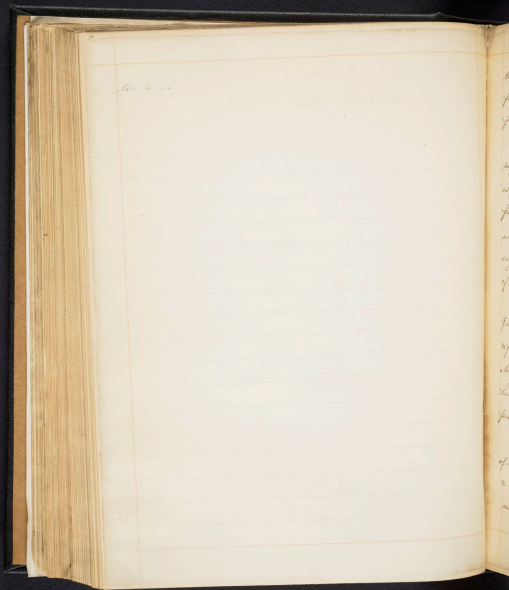


Articular Affections.

It is my purpose in the following pages to enter into a short examination of these highly important parts of the human frame, the Articulations, & subsequently to attend to the principal morbid affections to which they are subjected.

The joints are certainly to be classed among the most interesting parts of the mechanism of man, & cannot fail to enlist the attention of any one who bestows the slightest circumspicion in viewing their structure. Their aptitude to the purposes for which they apparently are intended, their remarkable strength without their destined motions being interfered with by excessive weight, & their graceful contour calculated to afford gratification to the eye, cannot fail to excite the admiration of the most casual observer.

The principal parts composing the articulations, it must be confessed, cannot be arranged among structures possessing the greatest vital powers; yet still, when assailed by disease they undergo extreme derangement, in many instances causing

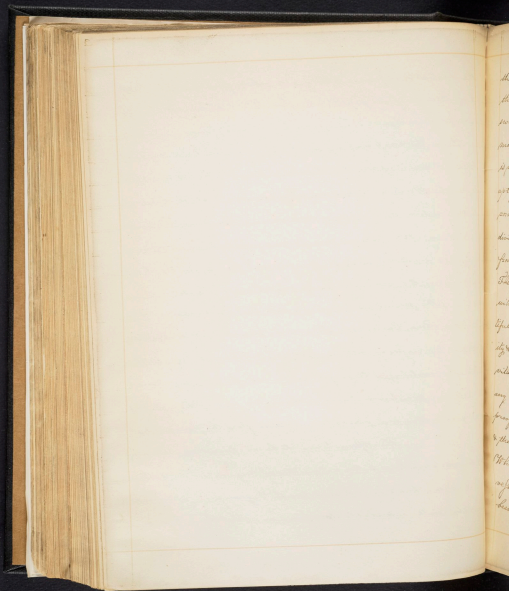


the most intense pain, calling into active operation all the finer feelings of the practitioner alike to the weakness of suffering humanity.

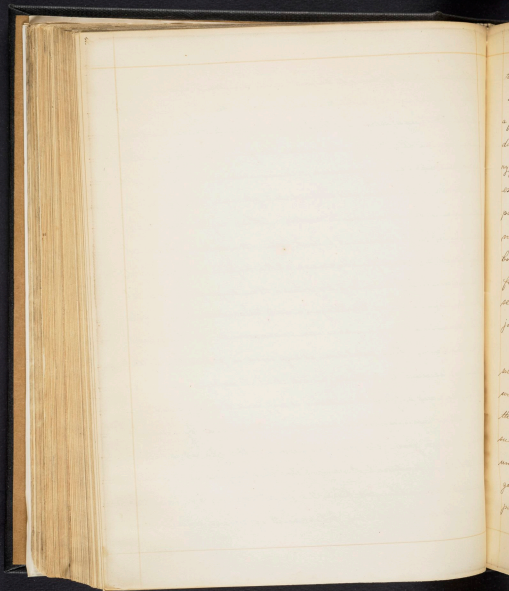
From the comparative paucity of communications on this subject, it would appear that diseases of the joints have not elicited as much attention as their important nature seems to demand, for which their infrequency of occurrence, when viewed together with many other diseases, may in some measure account; many engaged in medical pursuits therefore not having an opportunity of witnessing the various forms of articular affections.

The several parts entering into the composition of the Joint are Bone, Cartilage, Ligament, Synovial membranes & frequently masses of Adipose substance & Fibro-cartilage, as the Articular cartilages. Each particular one of those mentioned has its own peculiar interest, as being the seat of disease, & differing altogether or in very many respects from the remainder.

The Osseous type to be mentioned, in speaking of the Articulations is the extremities of long bones, as the knee & elbow; or a long bone whose articulating surface is accommodated with a suitable depression in a flat bone. These are



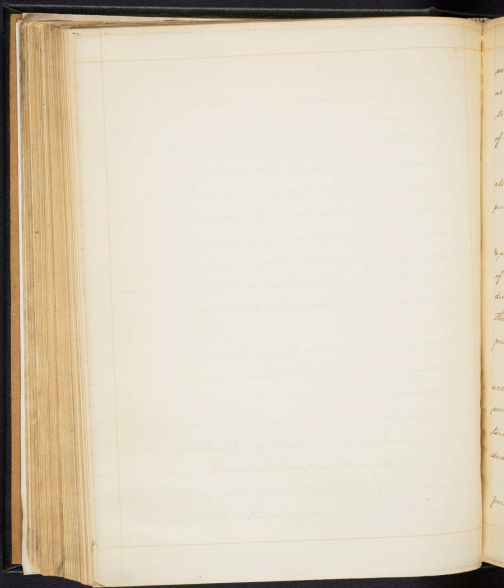
the description of bones to be met with in the larger joints, those claiming my attention at present. The long bones are swollen out, as it were, at their ends in order to render their union more secure. By this amplification the quantity of bony matter is not increased, but assumes a cellular arrangement, not inaptly compared to the cells observed in a sponge, having many communications from one to another. This may be proven by dividing a bone & exposing it to heat, when the marrow flowing from cell to cell, will finally escape at the inferior end extremity. The extremities of these long bones have their superficies covered with a thin plate of Cartilage, a substance presenting a smooth, polished, ivory appearance, remarkable for its durability & elasticity. This substance is supposed to possess but little vitality; indeed some have denied that it possesses that in any degree yet sufficient evidence is supposed to be afforded in proof that cartilage is in some degree vitalized by disease & the change from the cartilaginous to the osseous state. Whilst in a natural state not the least appearance of the vessels is observable, nor have the most expert Anatomists been able to trace any filaments of nerves entering,



their composition.

Ligament, placed under the diomed tissue evidently presents a fibrous arrangement; its fibres running, in no one particular direction. This tissue is extremely deficient in elasticity. Its great strength is possessed by ligaments, & in many instances extreme force is requisite to produce its rupture. The important articulations are secured by capsular as well as fibrous ligaments. The former are circular & enclosed at both the upper & lower extremities, & attached to the bones forming the joint. The latter are calculated, to give great security to the parts, many being found round a single joint.

The Synovial capsules are bags without any opening at the neck, lining the interior of the capsular ligament; & like a wise extended over the surface of the cartilage covering the articulating surfaces of the bones. When the capsular ligament is imperfect, the synovial membrane uniting with the external cellular substance forms a good substitute, being sufficiently firm without interfering on the articular movements. Inflammation, unac-



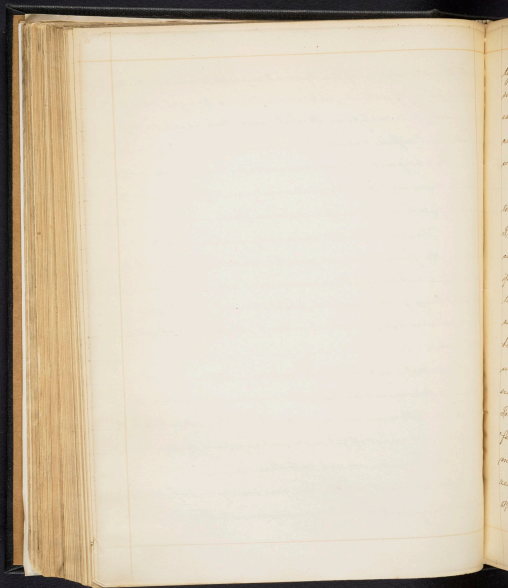
cells, the structure of the Synovial capsules, & exhibits them as consisting of cellular substance; they are thought, closely to resemble serous tissue. Bichat viewed them as interlacings of abundant vessels, or exhalants.

The Adipose substances discoverable in the joints are situated on the outside of the Synovial membrane, they are vascular, & probably furnish a portion of the synovial fluid.

The Synovia consists principally of albuminous matter & water; the former of which gives the consistence of the white of an egg to this fluid. It answers a very useful purpose in diminishing friction, which would otherwise be very great. The mechanic arts furnish abundant illustrations of this principle.

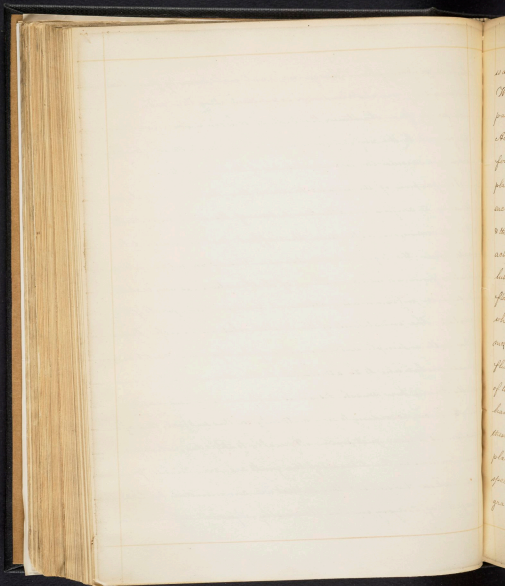
In several joints are found cartilages, differing in shape according to circumstances, as the surfaces vary to which they correspond. These are denominated from their situation intra-articular, & consist of fibrous & cartilaginous matter blended. They contain no red vessels.

An imperfect outline has now been given of the parts entering into articular arrangements. These different



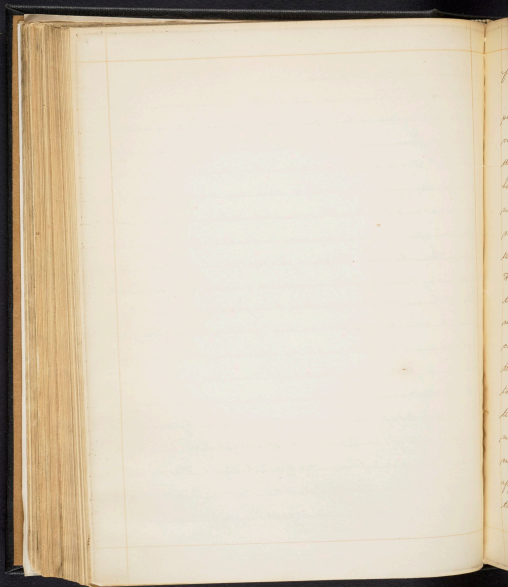
ligaments properly placed, & acquiring additional security from the surrounding muscles & tendinous expansions, altogether form an exceedingly firm structure, the bulk of which is abundantly confirmed by the infrequency of derangements from external violence, when we consider the important duties of the articulations.

In speaking of the diseases to which the joints are subject, intending to confine my attention to some of the most important, I shall commence with those that affect that extremely delicate tissue the Synovial membrane. This, as might be anticipated from an examination of its structure, is very liable to take on inflammatory action, at least in some parts of the world. The inhabitants of the British isles are much troubled with a simple inflammation of the Synovial membrane, in all probability to be attributed to the climate, as it is generally known how much disease is influenced by this cause. In America, according to good authority on this subject, this affection is seldom met with. Agreeably to Boerhaave, whose communications on the diseases of the joints are very highly prized, & whose divisions of this subject are commended by the Professor of Surgery in this University, Synovial inflammation



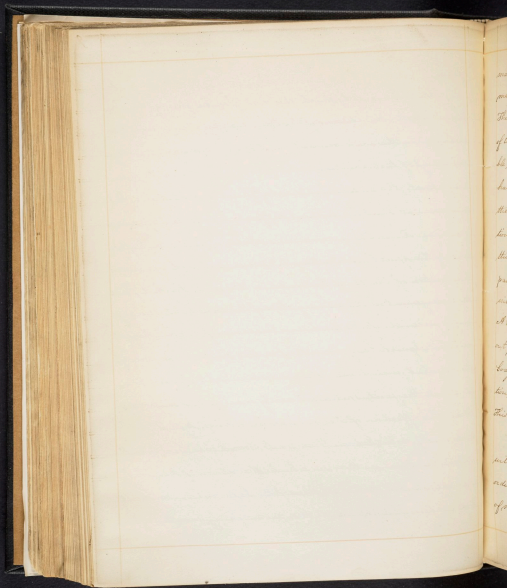
is divided into Acute & Chronic.

When acute inflammation attacks the Synovial membrane, the pain is described as being quite severe, as might be expected. Acute inflammation of the Synovial tissue causes exquisite suffering, & it is reasonable to calculate on the same effect taking place in the Synovial membrane since they so closely resemble each other in structure. The pain is extended over the entire joint, & the skin assumes a red appearance indicative of inflammatory action. When the disease has gone on for a short period, the natural lubricating fluid is greatly increased in quantity. The excessive flow of Synovia accommodates itself to the formation of the joint; where the neighbouring parts are rigid yielding the swelling is most apparent. Take for example the articulation at the knee, the fluid swells out the Synovial membrane at each side of the tendon of the Patella, & under the extensors of the thigh, whose tendons it reflected up under the muscular sheath. Together with these symptoms of a local, putative, constitutional disturbance takes place, & a fever of an inflammatory type is developed. This, acute species of inflammation, is of short duration, the symptoms gradually disappearing, or else degenerating into the Chronic.



form.

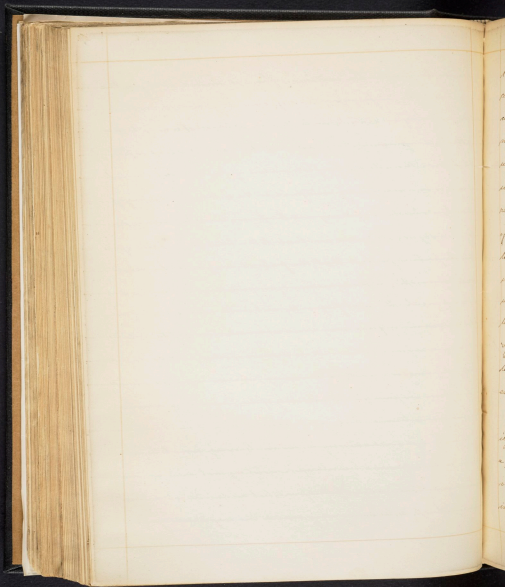
The *Chromia* is by much the most frequent form of the complaint. As in other diseases of this type, the symptoms are not so violent as in the acute description. They arise more gradually; the redness of the enveloping skin observable in the acute form being absent; the individual is not afflicted by severe pain, but may exercise his limb without suffering a great deal of incommode inconvenience. The swelling commences shortly after the manifestation of the symptoms mentioned, & increases in a slow manner. Fluctuation of the fluid contained in the joint, to which fluid the enlargement in the primary stage of this complaint is owing, may be perceived. After the disease has run on for some time, coagulable lymph being poured out on the internal surface of the synovial membrane, the undulation of the fluid contained in the joint is rendered nearly or altogether imperceptible. This affection of the synovial membrane is said to be more rarely witnessed in those joints covered over thickly with muscle &c, than in those in which the exterior of the joint approaches nearer the superficies of the body, owing no doubt to these being less exposed to the causes giving rise to inflammation.



motion in general. The exudaneous fluid is removed in a great measure after the progress of the inflammatory action is arrested. The motion of an articulation, are seldom as perfect after an attack of this kind as previously, & long exposure to the exciting causes is liable to renew the attack. If inflammation of the synovial membrane is not judiciously interfered with, but suffered to progress, the other structures entering into the formation of the articulation, may by degrees become involved to the total destruction of this important part; so that the patient may be under the painful necessity of having his limb by amputation. This disease is incomparably the most frequently met with in adults.

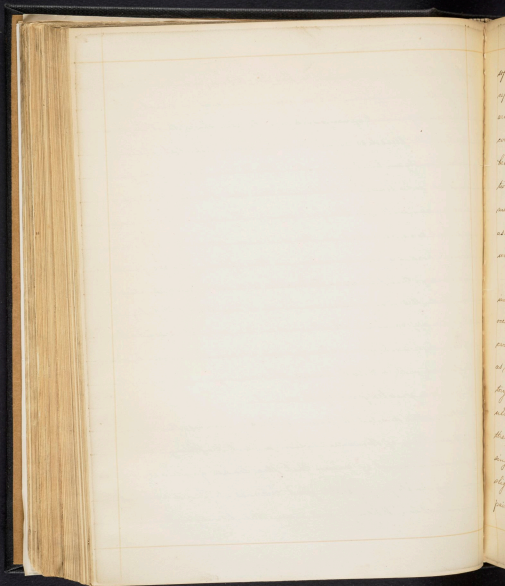
A large quantity of fluid may collect in an articular cavity, without pain or inflammation. Skin dropsies of other parts of the body, this may be considered as arising from an impaired absorption, or from an inordinate quantity of the fluid being secreted. This disease is termed *Hydrops Articuli*.

This is a disease very serious in its consequences to be met with in the synovial membrane, consisting not merely in an ordinary inflammation of this part, but added thereto a kind of morbidness, enhancing very much the unpleasant symp-



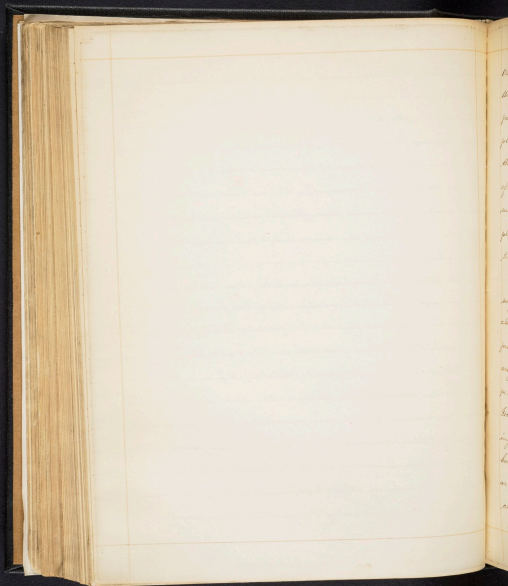
tons. Mr Brodie mentions in his Treatise a number of instances of this description, but in no one case does he speak of a cure independent of amputation. He also states that he never met with this disease in the shoulder or hip, but almost universally in the knee joint. This disease is commonly found in those who have not attained the adult standard, & particularly met with in the full grown. This is just the reverse of what was remarked in the common syphilitic inflammation. There is a peculiar action in this affection, as we find in many other diseases as Tubercular Abscess &c; on dissection we find the membrane in which it has its seat totally altered in appearance. Authorities on the subject describe the Synovial membrane as changed into a brownish material, interposed with whitish lines, & this change existing in the entire or a greater part of its extent.

When this morbid affection first commences, the rigidity & swelling of the articulation are but trifling, with a small amount of pain. But the disease gradually advancing in its progress, the joint becomes stiffened & almost immovable. When pressed upon the inflammation is



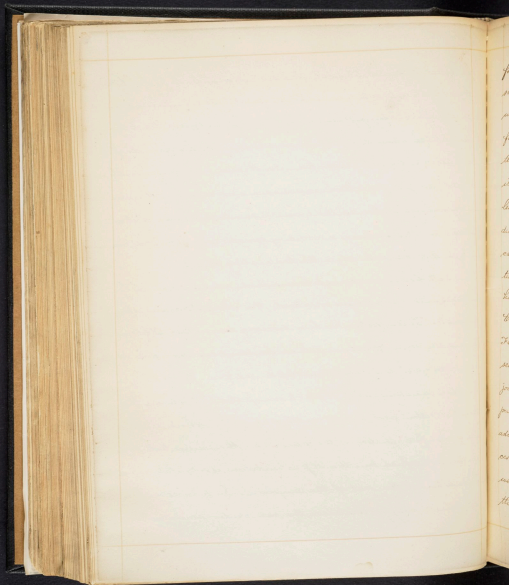
soft & elastic, & feels very much as if a fluid was enclosed. The description may be discovered by applying a hand on either side of the articulation, the flowing of a fluid not being observable, which circumstance is a diagnostic in endeavouring to discriminate between a morbid change of structure & ordinary inflammation of the synovial membrane. It is not supposed that a remedy calculated to arrest this affection is likely to be discovered, as a characteristic of the disease is, a total change from its natural structure.

The Ulcerative process sometimes takes place in the cartilages & in the facings of the articular extremities of the bones. When it occurs in the knee, some consider it a species of white swelling. The cartilages of the joints are said to be, not even as highly vitelified as cartilages in many other parts of the body; & if an inflammatory affection attacks them, osseous matter is not deposited, but ulceration ensues. This disease presents the following symptoms, the pain at the commencement is considerable, & goes on increasing till it becomes very severe. The tumefaction, which is but slight in the primary stage, keeps pace with the increasing pain, tho' the enlargement of the joint is seldom very great.

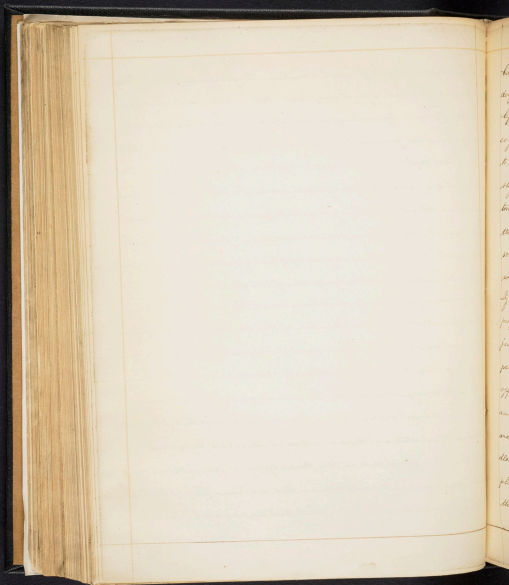


On dissection the cartilages are found nearly or quite destroyed by the ulcerative process, & various bones exposed. Accumulations of pus are almost always found in the advanced stages of the complaint, & sometimes the synovial membrane shows the progress of the disease. When this latter becomes inflamed, an enlargement of the joint similar to that occurring as a consequence of the primary inflammation of the synovial membrane may take place; but this is always a secondary symptom in ulcerated cases, & is met with only in the terminating stages.

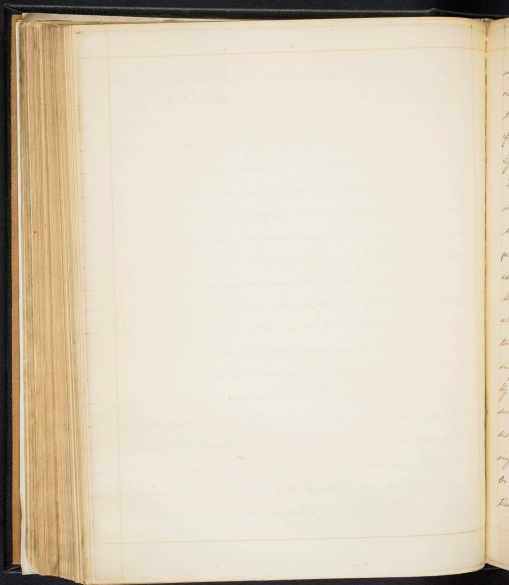
A disease now comes to be considered, which is viewed by surgeons with a great degree of interest, the *Alaba Brasaria* it has alluded to. This affection has been diversely designated; D'Alton prefers the term *Brosalgia*, which he thinks as expressive as any employed. This word is doubtless derived from *Bros*, an appellation sometimes used to denote one of the Pelvic bones, the *Isohium*, & the Greek word *algos*, denoting pain, the whole signifying a painful affection of the *Isohium*, in the immediate neighbourhood of, which bone the Hip articulation is situated, which articulation is the seat of the complaint. In diseases, whose course is so very protracted, as the one under consideration



For example, it is difficult to ascertain the particular part of the structure, which is first involved. But modern examinations, which are usually made after the affection has run on probably for years, most frequently reveal a mass so small & illegible, that the most experienced feel discouraged, in attempting to unravel its mysterious disorder, the proper mode of attaining correct knowledge on this subject being derivable from a scrutiny into the diseased structure before the surrounding tissues become implicated. Mr. Borden, after numerous dissections of articulations affected in this manner, & the symptoms of the disease of which he had previously narrowly watched, draws the conclusion that "Brachia consists in an ulceration of the cartilages of the Gleno-femoral articulations, occurring as an original affection, & resembling the disease last mentioned, as met with in the knee joint. In many cases, which he examined after death or amputation, the ulcerated state of the cartilage was but little advanced, in others it had progressed farther, & in some instances the contiguous parts as the bone, synovial membrane &c were drawn into the disease. Pus is always found, when the soft parts are ulcerated, but this is recorded as not

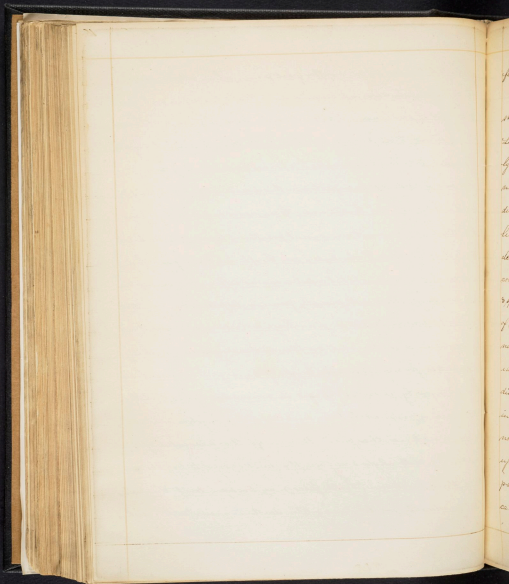


being the case in all instances where articular cartilage is undegenerating this proof. This disease may attack those advanced in life, the youthful, & all the intervening periods. Those of young years, & marked with the scrofulous diathesis are most liable to its attacks. Wasting of the muscles of the limb with a slight painful affection of the knee joint may be the only symptoms manifest for a long time. This pain of the knee is one of the many of these curious sympathetic affections to be observed in the human system, & if the surgeon was not aware of this circumstance his remedies might be egregiously misapplied. The patient after the disease has made some progress, being troubled with pain in the neighbourhood of the joint in which the disease is in reality seated, gives a tilt to his pelvis, & endeavours to turn the weight of his body to the side opposite the diseased one; he also directs the injured limb in an anterior direction, & flexes it somewhat. The Glutei muscles which are inserted into the upper extremity of the tibia femoris, dwindle away from want of their accustomed exercise, so that the plumpness & rotundity of the buttocks are lost, which gives to the affected side a peculiar flatness. Many patients labouring



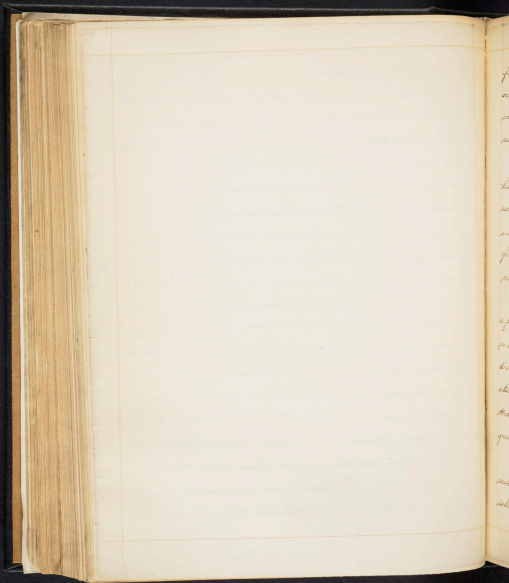
under particular diseases, suffer great pains, when others apparently as much diseased endure but little, &c. we find it in the present instance. Writers describe some of those who have fallen under this change afflicted with brachia as but slightly pained, whilst others suffer the most excruciating agony.

The cure which is to be expected in this disease is by Ankylosis, & is a desirable object to be attained. Care must be taken to place the limb in the most convenient position, before this natural process is completed. If Ankylosis can be effected before pus is formed so much the better, but it is described as difficult to accomplish this, as a large abscess will generally form in despite of the greatest attention rendered by the surgeon. Large collections of purulent matter accumulate in the joint, neither increasing or diminishing in quantity for a considerable length of time, so that are finally discharged by ulcerated papules in various directions thro' the surrounding parts. All these unpleasant symptoms may disappear in time, the pus be thrown off, the ulcerated openings heal &c. & Ankylosis perform the most complete possible cure. Or on the other hand, hectic fever may develop itself, the patient gradually wasting away, till death terminates the sufferings.



forings of the wretched patient:

A spontaneous luxation of the Hip, from which one occasion-
 stance, the disease has sometimes been designated a spontaneous
 'Luxation of the Os Femoris, may occur, & is attributed to coagulable
 lymph &c in the acetabulum by degrees, pumping the situation
 naturally allotted to the thigh bone, which had been previously
 diminished by caries, & afterwards the action of the muscles pul-
 ling up the bone upon the os innomin. This removal, or partial
 destruction of the head of the thigh bone, together with a like
 condition of the Acetabulum has been met with on dissection,
 & specimens of the kind are to be seen, at the present time in the hands
 of men curious in these important matters. The question may
 now present itself in, what manner, may the painful affection
 in the knee, depending upon inflammation in that joint, be
 distinguished from the pain caused by the knee's being drawn
 into sympathetick action, with the Hip articulation? The diag-
 nosis is, sufficiently clear, in the disease of the Hip by pressing
 upon the parts in the vicinity of the head of the thigh bone,
 pain is occasioned; whilst pain is not induced by the applica-
 tion of moderate force over the knee. When the knee is in

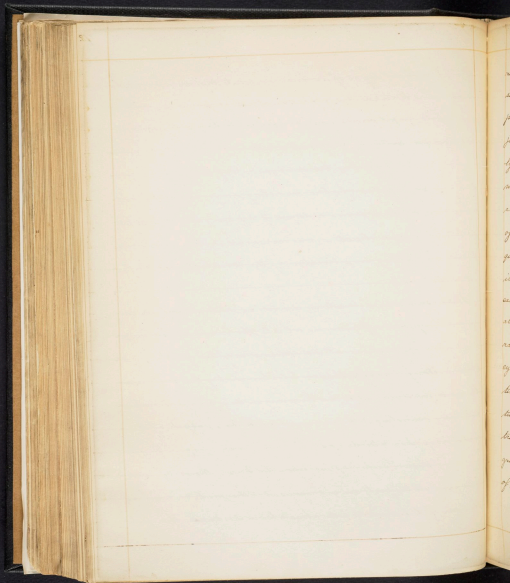


flamed a slight degree of violence augments the distaff considerably. This distention is of great practical importance, as otherwise efforts might perseveringly be applied to, the articulation not diseased, without a beneficial result.

Several of the derangements of the articulations have now been spoken of. One, consisting in an inflamed synovial membrane, a second a dropsy of this membrane, a third in which morbid structure was occasioned in this tissue, & a fourth, consisting in elevation of the cartilaginous surfaces of the joints.

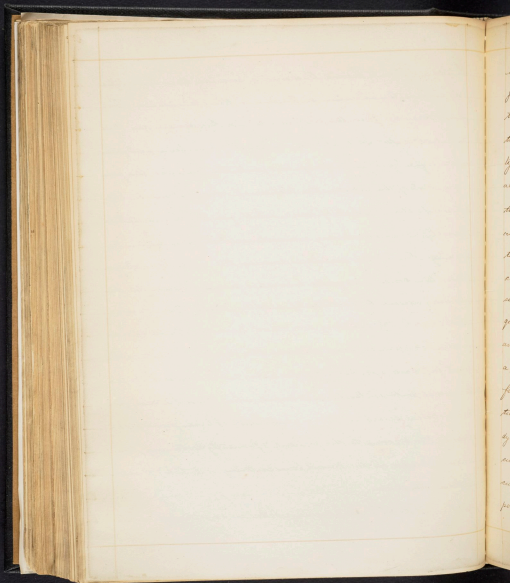
There is another interesting, disordered state consisting in a proper Scrophulous affection, in which the cancellous arrangement of the osseous tissue at the extremities of the Os Longa is diseased. Scrophulous affections, in whatever part of the body situated, are so fatal ultimately, & so lingering in their progress as renders them very interesting, & the persons subject to them objects of the greatest compassion & tenderness.

When Scrophula seizes upon the Dues, there is a deep seated pain in the part, an enlargement of the joint, & a tender & itched pain of the muscles both above & below the Dues. The pro-

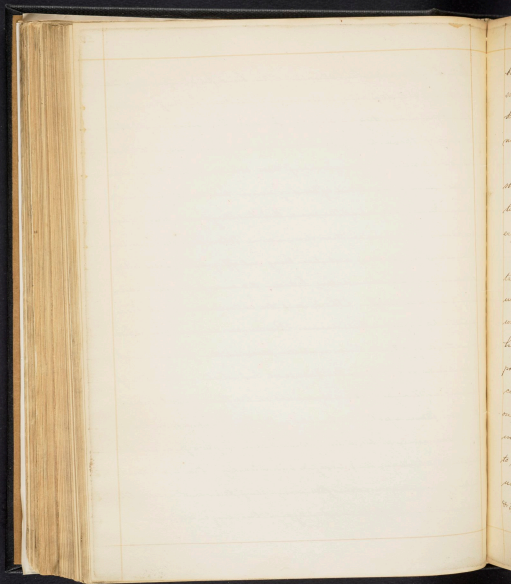


rounding soft parts become thickened after a long time has elapsed, causing the alteration in the size of the articulation. The patient may die from the irritation which the disease in the joint & ulcerated apertures may occasion, the bones being extensively destroyed by caries. In scrofulous joints the bones are the primary seats of the disease, the texture of which is remarkably changed, the Phosphate of Lime, which gives the firmness to the osseous tissue under ordinary circumstances, being very deficient in quantity. Finally the cartilages covering the articulation & extremities of the bones undergo the ulcerative process, when so the disease may extend to the other tissues of the joints. Those persons attacked with this distressing complaint have usually the characteristic marks of what is termed the Scrofulous diathesis, blue eyes, light hair, protuberant epigastrium. This disease is sometimes met with in the tarsus & metatarsus, when this is the case fistulous openings may exist for a great length of time, proving extremely troublesome to the patient, & frequently destroying the greater number of the small bones entering into the formation of these structures.

Moveable Cartilaginous bodies are sometimes formed



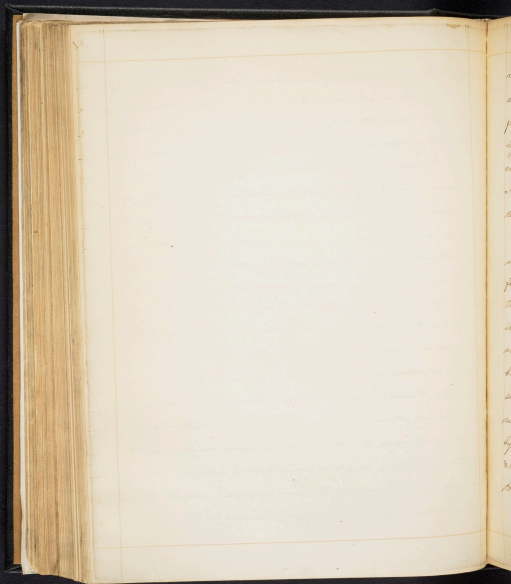
between the articular extremities of the bones, in the cavity of the joint. Most of the articulations may have these bodies formed in them; sometimes they are perfectly fused in their structure, at others they are of the nature of cartilage, & in many instances both these ligues are found in a single one of these excrescences. The synovial membrane forms a kind of bond of union between these bodies & the internal surface of the joint, thro' this they derive their nourishment & increase in their dimensions. When once this connection is dissolved, their nutrition being cut off, growth ceases, & they change their situation, rotting between the ends of the bones, causing great uneasiness. The knee is the articulation most frequently deranged in this manner. Brodie records a case in which an attack of Acute Rheumatism preceded the formation of a cartilaginous body in the knee joint, but whether the latter affection was thought to be consequential on the former is not mentioned. When a patient is troubled with this complaint, on the body in the cavity of the articulation shifting its place from its accustomed situation, the joint is fixed immovably, & the most excruciating pain is experienced, often compelling the most resolute persons to cry out from excess of agony. One single enormous



body, alone, is sometimes formed, at other times fifteen, twenty or even more. Professor Gibbon has recorded six several cases of this kind, & extracted bottles, varying extremely in their size from the dimensions of a common garden pea to those of an ordinary bean.

A sketch, very imperfect has now been given of the most instructive of the articular affections, & a short account of the various means employed, where relief is practicable, may not improperly be subjoined.

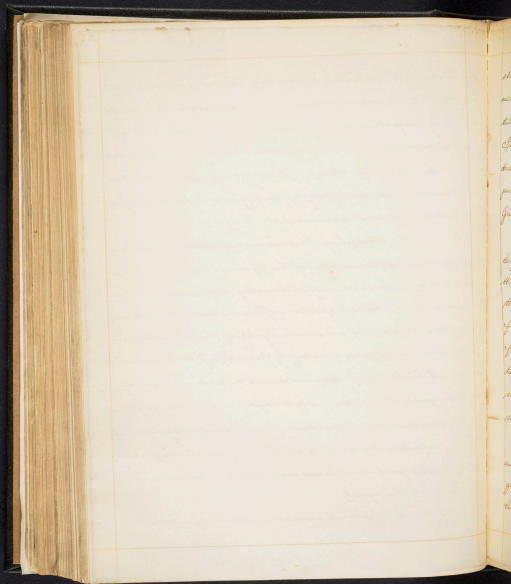
He who attempts to use his almost unassisted, & ponderous statures to move labouring under a tedious disease of an articulation, will have many difficulties to encounter. A person who has witnessed the ordinary accidents of families must have observed how apt an injured person is to set up his own opinion in opposition to those who ought, & are supposed to be better calculated to judge of his case than himself. For instance, let me receive a sprain in his ankle; do we find that man in general ready to renounce his ordinary occupations, & trust to the directions of his medical attendant? far from it; most usually he will exercise his limb in despite of injunctions, & thus defeat the most judicious schemes for the speedy



restoration of his disordered extremity. Thus it is in diseased articulations, polio, frequently advancing gradually, are opposed by the patient who is ignorant of these matters to be of less consequence, than his physician is disposed to admit. But even when orders are observed, the lingering affections of the articulations are confessedly difficult of cure, & many shaffle the skill of the most experienced.

Antiphlogistic measures are absolutely necessary in the Acute Inflammation of the Synovial membrane, as is found to be the case generally in diseases of increased action. Nothing answers a better purpose in inflammations of the extremities than the use of an elevated plane, formed by pillows or in any convenient way, operating by facilitating the return of blood. A blister round the joint is used & recommended by some surgeons, tho' condemned by Dr Physick. After the inflammation is considerably subdued, the extremity may be moved by the patient, or the hands of assistants, liniments may be used, & the affected part have frictions applied to it, which are said to diminish the rigidity.

When the Synovial membrane is morbidly altered, in

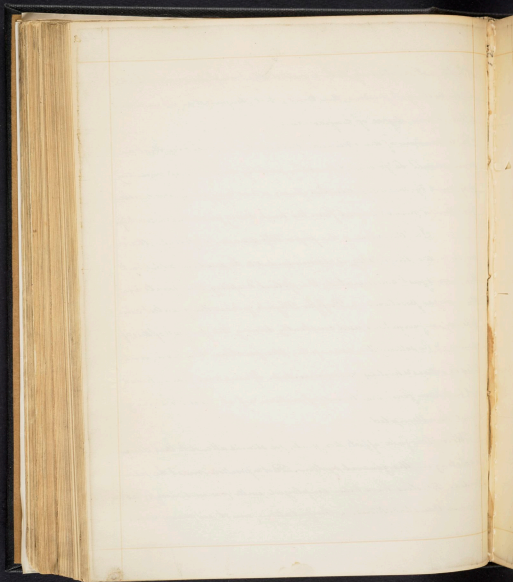


structures, it is extremely to be regretted, that, confidence, can be placed in nothing to preserve the limb; but Amputation alone is entitled, to any degree of confidence.

In Absorption of the Articular Cartilages, it is necessary that a drain should be formed, & this may probably be most conveniently performed by means of caustic issues, which may prove serviceable. Great benefit may be derived from the limb being preserved in quietude.

In Coxalgia or the proper Hip disease, a splint the length of the thigh & leg, is recommended to be used in addition to the means just enumerated; the splint keeping the parts in their proper position. Professor Physick places the greatest confidence in purgatives used constantly during the progress of this affection; & he, setting the example, the practice has been imitated by others & highly recommended. If an abscess forms, it must not be taken from the hands of nature, & if it breaks healing must be attempted.

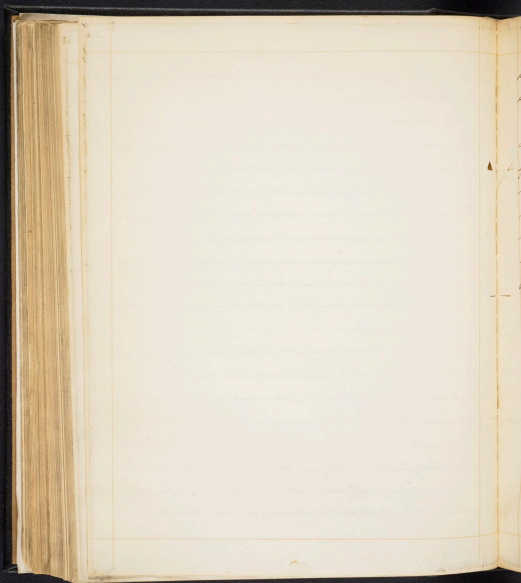
When Scrophula affects the joints, we should attend to this disease as existing in the general system. Rest & position must be regarded. Blisters have been employed with various success; as likewise Caustic Potents. Amputation must, in many cases



be performed, on account of the excessive disturbance of the system occasioned by this intolerable complaint.

An operation performed by fixing the body in a proper position, cutting down upon & extracting it, is the only permanent method of relieving a person troubled with Movable Cartilage. Linings & bandages around the joint afford temporary relief. Suppuration occurring in the joint after the extraction of spiculae cartilaginous bodies, accompanied by tetanic symptoms, opium, elevation of the extremity operated upon, together with an ordinary Bread & milk poultice are recommended by Dr Gibbon, in whom hands this treatment relieved the most violent symptoms of the kind alluded to.

It was my intention to take a general view of the articular affections, & this has been done. Their consequence is certainly very great, & the duration of many of these diseases is so considerable, as to render them peculiarly worthy our attention. Persons afflicted with morbid affections may endure for a long time great bodily suffering, & keep up their spirits in hope of ultimate relief being afforded; but when they find from time to time their expectations totally disappointed, their spirits can



scarcely fail to flag, & finally to rest. Thus it is found to be in diseases of the Articulations, as well as in other chronic affections.

To sum up all that has been attempted, in these pages, first, an outline of the parts concerned in the disease to be afterwards spoken of coarsely, then the principal articular affections, & in conclusion some of the principal means employed in the cure of these affections. I sufficient has been said in this rude description to give the most uninformed an idea of the importance of the subject. But when these matters are touched upon by the pen of a man, by one who can from his own experience describe symptoms & successful mode of practice, 'tis then that the importance of the subject is fully discerned, & appears in its most attractive dress. Still the youthful cultivator of medical & surgical as well as other sciences, tho' poor, not sheltered in the labours of wisdom & experience, may indulge in hope, & excited to exertion by the luminaries around him, may look forward to the time when he may acquire some degree of lustre, & ascend nearer & nearer the standard of perfection.

